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Supplement of

Relationships between milk protein polymorphisms and production traits in cattle: a systematic review and meta-analysis

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Supplemental Files

KAPPA CASEIN GENE GENOTYPIC DATA

Daily Milk Yield

First Author	Breeds	N	Type	Year	AA	SD1	N1	AB	SD2	N2	BB	SD3	N3	P
Bartonova et. al.,2012	Fleckvieh	152	Dairy	2012	22.68	13.62	45	23.33	16.09	74	22.92	11.66	24	**
Cardak 2005	Holstein friesian	237	Dairy	2005	29.18	5.95	113	27.62	3.41	121				**
Cardak 2005	Simmental	177	Other	2005	24.25	3.57	76	24.30	2.33	87	22.91	1.83	14	*
Dogru 1994	BrownSwiss	62	Other	1994	9.70	4.52	16	10.20	4.74	50	10.90	5.29	86	NS
Dogru 1994	Holstein	23	Dairy	1994	10.70	4.09	5	11.40	3.93	3	12.00	5.00	25	NS
Gurcan et. al.,2011	Holstein	90	Dairy	2011	18.14	5.78	90	17.35	3.06	27	17.27	5.39	22	NS
Heck et. al.,2009	Holstein	1428	Dairy	2009	13.44	6.01	601	13.38	3.67	686	13.21	2.731	141	*
Mohammadi et. al.,2013	Holstein	139	Dairy	2013	29.08	7.36	100	28.11	5.89	25	28.30	6.17	14	*
Molee et. al.,2015	Holstein	231	Dairy	2015	10.31	2.04	129	9.59	1.06	78	10.20	0.51	2	*
Ozdemir et. al.,2005	BrownSwiss	79	Other	2005	11.00	1.60	38	11.40	1.63	34	11.70	1.60	38	NS
Ozdemir et. al.,2005	Holstein	47	Dairy	2005	11.20	1.77	27	11.80	1.85	20	11.00	1.77	65	NS
Pawelska-Goral et.al.,2008	Holstein	41	Dairy	2008	29.04	3.14	18	28.50	4.01	18	28.00	4.45	5	*
Sekerden et al., 1999	Simmental	46	Other	1999	12.80	3.81	29	13.30	3.93	16				NS

Lactation Milk Yield

First Author	Breeds	N	Type	Year	AA	SD1	N1	AB	SD2	N2	BB	SD3	N3	P
Alim et. al.,2015	Holstein	752	Dairy	2015	9920.0	1861.2	562	9821.1	1227.6	193	9826.1	915.5	17	NS
Alipanah et. al.,2008	Black Pied	72	Dairy	2008	7807.0	725.5	50	6996.8	719.4	20	6821.8	859.4	2	NS
Alipanah et. al.,2008	Red Pied	98	Dairy	2008	6047.3	188.3	43	5954.1	161.9	49	5843.3	286.2	6	*
Bovenhuis et. al.,1992	Holstein	6803	Dairy	1992	6138.0	1010.0	4329	6087.0	753.7	2219	5965.0	974.1	255	NS
Deb et. al.,2014	HolsteinxSahiwal	200	Other	2014	2820.9	1773.0	117	3012.8	1730.9	83				
Djedovic et. al.,2015	Simmental	21	Other	2015	5966.0	802.0	9	6157.0	801.0	10	5370.0	536.0	2	*
Djedovic et. al.,2015	SimmentalxHolstein	20	Other	2015	4583.0	612.0	15	5143.0	533.0	5				*
Dogan and Kaygisiz 1999	BrownSwiss	264	Dairy	1999	4399.5	2574.8	201	4138.0	1696.3	53	3987.6	1783.4	10	*
Dogru 1994	BrownSwiss	62	Other	1994	2409.3	1096.0	16	2890.5	1135.6	50	3944.5	2200.5	25	*
Dogru 1994	Holstein	23	Dairy	1994	3545.5	674.2	5	3404.0	1611.0	3	3797.6	1183.2	144	NS
Dogru 2015a	Holstein	54	Dairy	2015	3658.9	1203.4	48	3559.2	1199.9	52	3157.7	2540.9	86	NS

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Dogru 2015a	BrownSwiss	108	Other	2015	3239.6	941.2	70	3461.4	954.1	189	3365.8	967.2	259	NS
Eenennaam et. al.,1991	BrownSwiss, Holstein, Jersey, Guernsey, MilkingShorthorn	1454	Dairy	1990	6839.0	6072.1	662	6985.0	4334.0	346	7135.0	2994.6	157	NS
Felenczak et. al.,2008a	Simmental	373	Other	2008	4163	897.1	93	4055	899.5	210	3957	836.4	70	NS
Gurcan et. al.,2011	Holstein	90	Dairy	2011	5481.0	1812.3	90	5426.0	973.2	27	5510.0	1693.7	22	NS
Hamza et. al.,2010	Holstein	237	Dairy	2010	7341.5	1365.3	68	7543.6	1518.7	86	7559.0	1381.4	83	NS
Hristov et. al.,2013	Rhodopean	90	Dairy	2013	3838.2	862.8	29	4112.0	1045.8	49	3495.0	1006.0	12	
Juszczak et. al.,2001	Black and White	146	Dairy	2001	5362.0	1035.0	91	5187.0	830.0	47	5391.0	845.0	8	NS
Kaygisiz et. al.,1999	Holstein	96	Dairy	1999	4482.6	2595.2	84	4478.5	2736.4	104	5650.0	2770.1	10	NS
Kaygisiz 2000	Simmental	251	Other	2000	5473.0	5269.7	579	5385.0	3600.7	150	4506.0	1180.9	22	NS
Lin et. al.,1986	Holstein, Ayrshire, its Crossbreed	920	Dairy	1986	4244.0	1769.4	326	4280.0	2075.0	556	4465.0	905.5	39	NS
Micinski et. al.,2006	Black and White	128	Dairy	2006	6542.0	1504.0	89	6272.0	1592.0	36	7653.0	3045.0	3	
Micinski et. al.,2006	Jersey	121	Dairy	2006	4019.0	1814.0	59	3913.0	1370.0	43	3826.0	1439.0	19	
Ozdemir et. al.,2005	Holstein	47	Dairy	2005	3883.3	934.3	27	4060.1	981.5	25	3533.6	949.7	65	NS
Ozdemir et. al.,2005	BrownSwiss	79	Other	2005	3591.3	850.1	38	3809.7	851.4	66	4003.2	859.3	38	NS
Sekerden et. al.,1999	Simmental	46	Other	1999	4318.0	822.2	29	4234.9	931.6	16				NS
Trakovicka et. al.,2012	SimmentalxHolstein	80	Other	2012	5114.2	1308.3	46	4972.9	1464.4	29	4786.0	1877.1	5	
Zhang et. al.,2007	Holstein	161	Dairy	2007	6785.4	2224.2	108	7056.1	3282.3	53				NS

Protein Content%

First Author	Breeds	N	Type	Year	AA	SD1	N1	AB	SD2	N2	BB	SD3	N3	P
Alim et. al.,2015	Holstein	752	Dairy	2015	3.11	0.24	562	3.12	0.14	193	3.21	0.12	17	**
Alipanah et. al.,2008	Black Pied	72	Dairy	2008	3.12	0.09	50	3.12	0.09	20	3.31	0.10	2	*
Alipanah et. al.,2008	Red Pied	98	Dairy	2008	3.26	0.03	43	3.26	0.03	49	3.35	0.07	6	*
Bartonova et. al.,2012	Fleckvieh	152	Dairy	2012	3.45	0.40	45	3.53	0.43	74	3.47	0.34	24	NS
Bovenhuis et. al.,1992	Holstein	6803	Dairy	1992	3.46	0.19	4329	3.49	0.47	2219	3.54	0.16	255	NS
Burbano et. al.,2010	Holstein	348	Dairy	2010	3.08	0.11	27	3.06	0.11	27	3.19	0.08	27	
Cardak et. al.,2005	Holstein friesian	237	Dairy	2005	3.31	0.21	113	3.32	0.11	121				NS
Cardak et. al.,2005	Simmental	177	Other	2005	3.62	0.17	76	3.54	0.09	87	3.54	0.11	14	**
Deb et. al.,2014	HolsteinxSahiwal	200	Other	2014	4.03	0.32	117	3.99	0.36	83				NS

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Eenennaam et. al.,1991	BrownSwiss, Holstein, Jersey, Guernsey, MilkingShorthorn	1454	Dairy	1990	3.58	1.18	662	3.60	0.84	346	3.64	0.58	157	NS
Felenczak et. al.,2006	Simmental	329	Other	2006	3.50	0.43	89	3.66	0.43	171	3.69	0.39	69	*
Felenczak et. al.,2008a	Simmental	373	Other	2008	3.42	0.16	93	3.46	0.17	210	3.50	0.14	70	NS
Hamza et. al.,2010	Holstein	237	Dairy	2010	3.35	0.49	68	3.36	0.45	86	3.50	0.50	83	*
Heck et. al.,2009	Holstein	1428	Dairy	2009	3.51	0.02	601	3.58	0.26	686	3.62	0.24	141	*
Hristov et. al.,2013	Rhodopean	90	Dairy	2013	3.66	0.32	29	3.63	0.28	49	3.56	0.35	12	
Juszczak et. al.,2001	Black and White	146	Dairy	2001	3.20	0.14	91	3.21	0.16	47	3.26	0.19	8	NS
Lukac et. al.,2015	Holstein	192	Dairy	2015	3.14	0.39	97	3.12	0.35	77	3.10	0.38	18	NS
Micinski et. al.,2006	Black and White	128	Dairy	2006	3.35	6.07	89	3.30	7.08	36	3.31	4.62	3	NS
Micinski et. al.,2006	Jersey	121	Dairy	2006	3.93	6.05	59	4.03	5.72	43	4.07	7.96	19	NS
Mohammadi et. al.,2013	Holstein	139	Dairy	2013	3.09	0.27	100	3.19	0.13	25	3.20	0.36	14	*
Molee et. al.,2015	Holstein	231	Dairy	2015	2.98	0.23	129	3.01	0.18	78	2.92	0.06	2	*
Pawelska-Goral et. al.,2008	Holstein	41	Dairy	2008	3.63	0.42	18	3.76	0.32	18	3.72	0.52	5	*
Sekerden et. al.,1999	Simmental	46	Other	1999	4.10	0.26	29	4.00	0.30	16				NS
Zhang et. al.,2007	Holstein	161	Dairy	2007	3.07	0.31	108	3.06	0.29	53				

Protein Yield

First Author	Breeds	N	Type	Year	AA	SD1	N1	AB	SD2	N2	BB	SD3	N3	P
Alim et. al.,2015	Holstein	752	Dairy	2015	307.37	61.87	562	305.06	39.73	193	314.78	27.25	17	
Alipanah et. al.,2008	Black Pied	72	Dairy	2008	243.58	145.59	50	218.19	91.32	20	226.27	34.49	2	
Alipanah et. al.,2008	Red Pied	98	Dairy	2008	231.88	49.12	43	233.30	50.96	49	243.35	38.48	6	
Eenennaam et. al.,1991	BrownSwiss, Holstein, Jersey, Guernsey, MilkingShorthorn	1454	Dairy	1990	240.00	187.82	662	247.00	133.92	346	256.00	92.72	157	
Felenczak et. al.,2008a	Simmental	373	Other	2008	142.00	29.26	93	140	30.97	210	138	31.17	70	NS
Juszczak et. al.,2001	Black and White	146	Dairy	2001	160.00	30.60	91	154.20	26.80	47	158.10	24.90	8	
Micinski et. al.,2006	Black and White	128	Dairy	2006	219.00	16.70	89	208.00	18.30	36	251.00	25.73	3	
Micinski et. al.,2006	Jersey	121	Dairy	2006	158.00	17.87	59	157.00	12.26	43	155.00	13.99	19	
Bovenhuis et. al.,1992	Holstein	6803	Dairy	1992	211.90	32.80	4329	212.22	36.27	2219	210.67	29.06	255	

Fat Content %

First Author	Breeds	N	Type	Year	AA	SD1	N1	AB	SD2	N2	BB	SD3	N3
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Alim et. al.,2015	Holstein	752	Dairy	2015	3.75	0.78	562	3.79	0.50	193	3.87	0.37	17	P
Alipanah et. al.,2008	Black Pied	72	Dairy	2008	4.42	0.20	50	4.30	0.19	20	4.79	0.23	2	NS
Alipanah et. al.,2008	Red Pied	98	Dairy	2008	3.75	0.04	43	3.76	0.04	49	3.79	0.07	6	*
Bartonova et. al.,2012	Fleckvieh	152	Dairy	2012	4.06	0.94	45	4.09	1.12	74	4.10	0.78	24	NS
Bovenhuis et. al.,1992	Holstein	6803	Dairy	1992	4.56	0.44	4329	4.57	0.47	2219	4.61	0.48	255	NS
Burbano et. al.,2010	Holstein	348	Dairy	2010	3.12	0.58	27	3.72	0.66	27	3.92	0.37	27	**
Cardak 2005	Holstein friesian	237	Dairy	2005	4.25	0.43	113	4.22	0.22	121				
Cardak 2005	Simmental	177	Other	2005	4.14	0.52	76	4.09	0.28	87	3.98	0.26	14	NS
Deb et. al.,2014	HolsteinxSahiwal	200	Other	2014	4.03	0.32	117	3.99	0.36	83				NS
Djedovic 2015	SimmentalxHolstein	20	Other	2015	3.90	0.13	15	3.78	0.12	5	3.98	0.04	2	NS
Djedovic 2015	Simmental	21	Other	2015	3.98	0.06	9	4.00	0.07	10				NS
Dogru 1994	BrownSwiss	62	Other	1994	3.92	0.44	16	4.05	0.42	50	3.98	0.46	86	NS
Dogru 1994	Holstein	23	Dairy	1994	4.06	0.40	5	3.94	0.38	3	4.06	0.50	25	NS
Dogru 2015a	BrownSwiss	108	Other	2015	3.84	57.73	70	3.91	59.12	189	3.93	59.54	259	NS
Dogru 2015a	Holstein	54	Dairy	2015	3.65	45.73	48	3.50	45.43	52	3.78	44.40	144	NS
Eenennaam et. al.,1991	BrownSwiss, Holstein, Jersey, Guernsey, MilkingShorthorn	1454	Dairy	1990	4.32	2.08	662	4.28	14.88	346	4.26	1.03	157	*
Felenczak et. al.,2006	Simmental	329	Other	2006	4.13	0.62	89	4.22	0.60	171	4.20	0.64	69	NS
Felenczak et. al.,2008a	Simmental	373	Other	2008	4.01	0.30	93	4.03	0.31	210	4.09	0.26	70	NS
Hamza et. al.,2010	Holstein	237	Dairy	2010	3.62	0.72	68	3.66	0.64	86	3.89	0.77	83	NS
Heck et. al.,2009	Holstein	1428	Dairy	2009	4.36	0.02	601	4.38	1.05	686	4.37	0.71	141	*
Hristov et. al.,2013	Rhodopean	90	Dairy	2013	4.70	0.32	29	4.66	0.35	49	4.66	0.62	12	NS
Juszczak et. al.,2001	Black and White	146	Dairy	2001	4.06	0.30	91	3.96	0.24	47	3.82	0.26	8	
Lukac et. al.,2015	Holstein	192	Dairy	2015	3.28	0.10	97	3.24	0.09	77	3.31	0.13	18	*
Micinski et. al.,2006	Black and White	128	Dairy	2006	4.01	8.77	89	4.00	9.24	36	3.72	9.96	3	NS
Micinski et. al.,2006	Jersey	121	Dairy	2006	5.92	10.47	59	6.05	10.22	43	5.78	9.60	19	NS
Mohammadi et. al.,2013	Holstein	139	Dairy	2013	3.44	0.53	100	3.39	0.29	25	3.39	0.31	14	NS
Molee et. al.,2015	Holstein	231	Dairy	2015	3.91	0.45	129	3.98	0.35	78	3.81	0.11	2	NS
Ozdemir et. al.,2005	BrownSwiss	79	Other	2005	3.95	0.38	38	3.99	0.38	66	4.02	0.43	65	*
Ozdemir et. al.,2005	Holstein	47	Dairy	2005	3.60	0.42	27	3.60	0.44	25	3.86	0.38	38	NS

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Pawelska-Goral et. al.,2008	Holstein	41	Dairy	2008	4.08	0.57	18	4.45	4.32	18	4.61	0.55	5	NS
Sekerden et. al.,1999	Simmental	46	Other	1999	4.00	0.79	29	3.90	0.75	16				*
Zhang et. al.,2007	Holstein	161	Dairy	2007	3.63	0.73	108	3.53	0.66	53				NS
Fat yield														
First Author	Breeds	N	Type	Year	AA	SD1	N1	AB	SD2	N2	BB	SD3	N3	
Alim et. al.,2015	Holstein	752	Dairy	2015	369.25	84.87	562	369.80	54.46	193	380.34	37.39	17	P
Alipanah et. al.,2008	Black Pied	72	Dairy	2008	343.45	32.92	50	296.20	2.64	20	324.13	38.99	2	NS
Alipanah et. al.,2008	Red Pied	98	Dairy	2008	226.23	7.47	43	223.22	6.42	49	220.40	11.35	6	*
Bovenhuis et. al.,1992	Holstein	6803	Dairy	1992	278.50	43.20	4329	276.00	49.93	2219	273.22	40.56	255	*
Djedovic et. al.,2015	Simmental	21	Other	2015	222.10	52.90	9	254.20	41.60	10	214.40	20.70	2	
Djedovic et. al.,2015	SimmentalxHolstein	20	Other	2015	178.80	21.60	15	194.30	18.60	5				*
Dogru 1994	BrownSwiss	62	Other	1994	95.50	42.80	16	115.70	44.55	50	123.20	50.07	86	*
Dogru 1994	Holstein	23	Dairy	1994	143.70	38.46	5	130.10	37.07	3	158.40	47.00	25	*
Dogru 2015a	Holstein	54	Dairy	2015	135.40	83.83	48	137.20	83.65	52	149.10	81.60	144	NS
Dogru 2015a	BrownSwiss	108	Other	2015	122.90	42.67	70	138.10	43.99	189	130.80	45.06	259	NS
Eenennaam et. al.,1991	BrownSwiss, Holstein, Jersey, Guernsey, MilkingShorthorn	1454	Dairy	1990	290.00	239.28	662	292.00	169.27	346	299.00	117.78	157	*
Felenczak et. al.,2008a	Simmental	373	Other	2008	167.00	39.72	93	163.00	37.39	210	162	38.47	70	NS
Hristov et. al.,2013	Rhodopean	90	Dairy	2013	180.27	39.20	29	191.45	48.79	49	161.17	36.55	12	*
Juszczak et. al.,2001	Black and White	146	Dairy	2001	217.70	44.50	91	205.40	34.70	47	204.70	26.80	8	
Lin et. al.,1986	Holstein, Ayrshire, its Crossbreed	920	Dairy	1986	170.00	72.22	326	169.00	94.32	556	177.00	37.47	39	NS
Micinski et. al.,2006	Black and White	128	Dairy	2006	261.00	14.08	89	251.00	17.56	36	290.00	19.86	3	NS
Micinski et. al.,2006	Jersey	121	Dairy	2006	237.00	17.95	59	236.00	14.19	43	220.00	12.14	19	NS
Ozdemir et. al.,2005	Holstein	47	Dairy	2005	142.90	40.01	27	150.00	42.00	25	155.50	36.98	38	NS
Ozdemir et. al.,2005	BrownSwiss	79	Other	2005	141.30	36.37	38	152.40	36.56	66	141.80	40.31	65	NS
Trakovicka et. al.,2012	SimmentalxHolstein	80	Other	2012	222.80	67.31	46	218.80	65.74	29	217.80	92.51	5	NS

N:Numbers of records, SD: Standard Deviation, P: Significant level, NS: Non-significant, *:p<0.05, **:p<0.01

BETA CASEIN GENE GENOTYPIC DATA**Daily Milk Yield**

First Author	Breeds	N	Type	Year	AA	SD1	N1	AB	SD2	N2	BB	SD3	N3	P
Cardak 2005	Holstein	231	Dairy	2005	28.65	7.42	220	27.29	2.22	11				
Cardak 2005	Simmental	164	Other	2005	23.53	4.60	126	24.40	3.51	38				
Dogru 1994	BrownSwiss	79	Other	1994	10.30	4.76	36	10.40	4.75	38	9.60	3.98	5	NS
Dogru 1994	Holstein	39	Dairy	1994	11.50	4.92	33	10.90	3.94	4	12.00	3.72	2	NS
Gurcan et. al.,2011	Holstein	90	Dairy	2011	16.52	5.00	193	17.09	5.66	13				
Heck et. al.,2009	Holstein	1910	Dairy	2009	13.89	8.78	1827	13.96	3.83	21				*
Molee et. al.,2015	Holstein	231	Dairy	2015	9.90	2.65	40	10.12	1.26	122				*
Ozdemir et. al.,2007	Holstein	45	Dairy	2007	11.70	2.06	80	12.10	1.54	9	11.40	1.77	2	NS
Ozdemir et. al.,2007	BrownSwiss	80	Other	2007	11.30	2.06	117	9.70	1.56	58	11.90	1.56	1	NS
Sekerden et. al.,1999	Simmental	115	Other	1999	13.70	3.30	44	12.30	4.09	71				NS

Lactation Milk Yield

First Author	Breeds	N	Type	Year	AA	SD1	N1	AB	SD2	N2	BB	SD3	N3	P
Dogru 1994	BrownSwiss	79	Other	1994	3032.9	1238.7	36	2889.3	1223.1	38	2927.1	1026.3	5	NS
Dogru 1994	Holstein	39	Dairy	1994	3518.1	1288.2	33	3197.8	1016.1	4	4370.3	964.1	2	*
Dogan and Kaygisiz 1999	BrownSwiss	264	Other	1999	3875.0	315.0	47	4038.9	262.9	139	4174.0	255.1	78	NS
Eenennaam et. al.,1991	BrownSwiss, Holstein, Jersey, Guernsey, MilkingShorthorn	1454	Other	1990	7096.9	596.8	1029	6858.0	807.0	114	6684.0	1594.7	22	NS
Gurcan et. al.,2011	Holstein	90	Dairy	2011	4984.0	2181.5	193	5104.0	1151.3	13				
Kaygisiz et. al.,1999	Holstein	96	Dairy	1999	4914.8	2874.2	200	4063.6	1229.6	6	4808.0	4776.1	227	NS
Kaygisiz 2000	Simmental	265	Other	2000	5850.0	4052.8	138	5542.0	5319.4	406				NS
Micinski et. al.,2006	Black and White	128	Dairy	2006	6485.0	1496.0	124	8756.0	12.5	4	3701.0	1930.0	5	
Micinski et. al.,2006	Jersey	121	Dairy	2006	3954.0	1852.0	79	3992.0	18.5	37				NS

Supplemental Files

Mir et. al.,2014	Sahiwal	120	Other	2014	2529.6	964.8	103	2379.2	635.4	17				
Ozdemir et. al.,2007	Holstein	45	Dairy	2007	4001.4	1059.9	80	4558.4	783.1	9	3641.3	911.8	2	NS
Ozdemir et. al.,2007	BrownSwiss	80	Other	2007	3738.7	867.5	117	3489.2	789.6	59	4306.5	788.4	1	NS
Sekerden et. al.,1999	Simmental	115	Other	1999	4413.9	823.5	44	4194.4	656.2	71				NS
Protein Content														
First Author	Breeds	N	Type	Year	AA	SD1	N1	AB	SD2	N2	BB	SD3	N3	P
Cardak 2005	Holstein	231	Dairy	2005	3.31	0.30	220	3.23	0.10	11				
Cardak 2005	Simmental	164	Other	2005	3.57	0.22	126	3.41	0.19	38				
Eenennaam et. al.,1991	BrownSwiss, Holstein, Jersey, Guernsey, MilkingShorthorn	1454	Dairy	1990	3.59	11.87	1029	3.61	0.51	114	3.63	0.31	22	
Heck et. al.,2009	Holstein	1910	Dairy	2009	3.52	0.86	1827	3.54	0.46	21				
Micinski et. al.,2006	Holstein	128	Dairy	2006	3.34	6.19	124	3.23	7.34	4				
Micinski et. al.,2006	Jersey	121	Dairy	2006	4.00	6.07	79	3.98	7.09	37	3.91	3.57	5	
Molee et. al.,2015	Holstein	231	Dairy	2015	2.98	0.28	40	3.03	0.13	122				
Sekerden et. al.,1999	Simmental	115	Other	1999	4.00	0.32	44	4.00	0.25	71				
Protein Yield														
First Author	Breeds	N	Type	Year	AA	SD1	N1	AB	SD2	N2	BB	SD3	N3	P
Micinski et. al.,2006	Holstein	128	Dairy	2006	217.00			279.00						*
Micinski et. al.,2006	Jersey	121	Dairy	2006	158.00			158.00			144.00			NS
Sekerden et. al.,1999	Simmental	115	Other	1999	175.50			166.70						
Fat Content														
First Author	Breeds	N	Type	Year	AA	SD1	N1	AB	SD2	N2	BB	SD3	N3	P
Cardak 2005	Holstein	231	Dairy	2005	4.23	0.59	220	4.13	0.17	11				NS
Cardak 2005	Simmental	164	Other	2005	4.19	0.67	126	4.05	0.43	38				*
Dogru 1994	BrownSwiss	79	Other	1994	4.04	0.47	36	4.03	0.51	38	4.08	4.12	5	NS
Dogru 1994	Holstein	39	Dairy	1994	4.06	0.55	33	3.82	0.40	4	3.94	0.39	2	*
Eenennaam et. al.,1991	BrownSwiss, Holstein, Jersey, Guernsey, MilkingShorthorn	1454	Dairy	1990	4.25	2.02	1029	4.24	0.89	114	4.31	0.55	22	NS

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Heck et. al.,2009	Holstein	1910	Dairy	2009	4.24	0.04	1827	4.27	1.09	21				NS
Micinski et. al.,2006	Holstein	128	Dairy	2006	4.00	8.71	124	3.65	9.06	4				NS
Micinski et. al.,2006	Jersey	121	Dairy	2006	5.90	10.01	79	6.04	11.53	37	6.10	2.25	5	NS
Molee et. al.,2015	Holstein	231	Dairy	2015	3.94	0.56	40	3.96	0.26	122				NS
Ozdemir et. al.,2007	Holstein	45	Dairy	2007	3.73	0.49	80	3.59	0.36	9	3.97	0.43	2	NS
Ozdemir et. al.,2007	BrownSwiss	80	Other	2007	4.02	0.40	117	3.81	0.37	58	3.72	0.37	1	NS
Sekerden et. al.,1999	Simmental	115	Other	1999	3.90	0.35	44	4.20	0.67	71				NS

Fat Yield

First Author	Breeds	N	Type	Year	AA	SD1	N1	AB	SD2	N2	BB	SD3	N3	P
Dogru 1994	BrownSwiss	79	Other	1994	120.20	47.57	36	113.60	46.46	38	117.00	39.32	5	NS
Dogru 1994	Holstein	39	Dairy	1994	140.80	49.19	33	124.10	38.91	4	182.40	36.98	2	**
Eenennaam et. al.,1991	BrownSwiss, Holstein, Jersey, Guernsey, MilkingShorthorn	1454	Dairy	1990	297.17	230.96	1029	286.35	101.64	114	281.00	54.84	22	NS
Micinski et. al.,2006	Holstein	128	Dairy	2006	308.00	14.62	124	356.00	11.87	4				NS
Micinski et. al.,2006	Jersey	121	Dairy	2006	233.00	16.40	79	239.00	15.92	37	226.00	19.58	5	NS
Ozdemir 2007	BrownSwiss	80	Other	2007	150.10	37.86	117	135.90	34.08	58	143.90	39.60	2	NS
Ozdemir 2007	Holstein	45	Dairy	2007	151.80	46.51	80	167.80	33.90	9				NS

N:Numbers of records, SD: Standard Deviation, P: Significant level, NS: Non-significant, *:p<0.05, **:p<0.01

Supplemental Files

BLG GENE GENOTYPIC DATA

Daily Milk Yield

First Author	Breeds	N	Type	Year	AA	SD1	N1	AB	SD2	N2	BB	SD3	N3	P
Cardak 2005	Holstein friesian	237	Dairy	2005	26.89	2.66	35	29.06	5.50	112	28.10	3.98	90	**
Cardak 2005	Simmental	177	Other	2005	26.89	2.65	46	29.06	2.54	82	28.10	2.37	46	**
Dogru 1994	Holstein	39	Dairy	1994	9.20	3.75	6	11.60	4.32	47	11.20	4.18	47	*
Dogru 1994	BrownSwiss	79	Other	1994	9.50	4.05	25	10.10	4.90	124	10.30	4.45	63	NS
Gurcan 2011	Holstein	90	Dairy	2011	18.20	5.66	92	17.19	5.77	68	17.10	6.09	49	
Mohammadi et. al.,2013	Holstein	139	Dairy	2013	25.58	5.79	60	28.76	8.08	39	28.74	7.34	40	
Molee et. al.,2015	Holstein	231	Dairy	2015	10.39	1.46	40	10.20	1.88	122	9.14	1.71	66	*
Ozdemir et. al.,2007	Holstein	45	Dairy	2007	11.70	1.59	7	11.70	1.87	61	11.40	1.88	23	NS
Ozdemir et. al.,2007	BrownSwiss	80	Other	2007	10.90	1.73	38	11.60	1.54	49	11.20	1.81	91	NS
Sekerden et. al.,1999	Simmental	96	Other	1999	12.70	3.86	17	13.70	3.45	53	13.10	3.41	26	NS

Lactation Milk Yield

First Author	Breeds	N	Type	Year	AA	SD1	N1	AB	SD2	N2	BB	SD3	N3	P
Czerniawska et. al.,2011	Holstein	102	Dairy	2011	6642.7	605.9	8	6050.4	1170.5	40	6438.0	814.7	52	NS
Dogan and Kaygisiz 1999	BrownSwiss	264	Other	1999	3979.0	257.2	75	2909.4	271.9	132	4200.0	297.4	57	NS
Dogru 1994	BrownSwiss	79	Other	1994	2842.8	1061.5	25	2915.4	1266.1	124	2961.3	1161.2	63	NS
Dogru 1994	Holstein	39	Dairy	1994	3184.9	982.5	6	3483.9	1117.5	47	3572.1	1085.9	47	NS
Dogru 2015b	Holstein	64	Dairy	2015	3851.1	1117.4	13	3829.9	1175.3	158	3624.3	1163.1	112	NS
Dogru 2015b	BrownSwiss	129	Other	2015	3325.2	932.6	101	3383.6	980.1	259	3406.9	959.7	255	NS
Dokso et. al.,2011	Holstein	113	Dairy	2011	10577.1	1769.4	15	10022.5	1783.8	67	9652.1	3371.5	31	NS
Eenennaam et. al.,1991	BrownSwiss, Holstein, Jersey, Guernsey, MilkingShorthorn	1165	Dairy	1990	7021.0	3122.0	175	6993.0	5645.5	624	6945.0	4323.6	366	NS
Felenczak et. al.,2008b	Simmental	367	Other	2008	4118.0	1312.0	79	4531.0	1403.1	185	4530.0	1308.1	103	*
Gurcan 2011	Holstein	90	Dairy	2011	5445.0	1794.4	92	5393.0	1812.3	68	5142.0	1925.6	49	
Heidari et. al.,2009	Holstein	101	Dairy	2009	12979.0	837.0	26	12032.0	796.0	55	10788.0	922.0	20	**
Hristov et. al.,2013	Rhodopean	90	Dairy	2013	3581.5	924.6	36	3955.2	177.4	2	42405.0	1173.8	58	

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Juszczak et. al.,2001	Black and White	146	Dairy	2001	5547.0	957.0	37	5294.0	935.0	68	5150.0	1011.0	41	NS
Juszczak et. al.,2001	Polish Red	124	Other	2001	2387.0	355.0	60	2649.0	565.0	54	2614.0	593.0	10	NS
Kaygisiz et. al.,1999	Holstein	96	Dairy	1999	4407.4	1671.5	55	4715.4	2643.4	106	4344.7	1859.6	45	*
Kaygisiz 2000	Simmental	271	Other	2000	5707.0	5214.7	217	5597.0	5887.1	380	6049.0	5788.4	164	*
Lin et. al.,1986	Holstein, Ayrshire, its Crossbreed	920	Dairy	1986	4452.0	950.9	27	4230.0	1611.3	343	4307.0	1899.6	550	NS
Micinski et. al.,2006	Black and White	128	Dairy	2006	7048.0	1410.0	36	6347.0	1749.0	65	6139.0	1768.0	27	
Micinski et. al.,2006	Jersey	121	Dairy	2006	4128.0	1536.0	32	3894.0	1748.0	65	3881.0	1284.0	24	NS
Ojala et. al.,2004	Ayrshire	1548	Dairy	2004	6667.0	944.0	1429	6635.0	933.0	7482	6605.0	920.0	9193	**
Ozdemir et. al.,2007	Holstein	45	Dairy	2007	3945.2	790.6	7	4031.5	922.4	61	3768.7	940.0	22	NS
Ozdemir et. al.,2007	BrownSwiss	80	Other	2007	3415.6	869.2	38	3934.6	783.3	49	3615.2	907.2	91	NS
Sekerden et. al.,1999	Simmental	96	Other	1999	4141.6	730.0	17	4455.3	798.3	53	4275.1	795.7	26	NS
Singh et. al.,2015	HolsteinxSahiwal	126	Other	2015	2527.7	829.5	30	2678.4	1193.8	36	2514.4	1059.0	60	*
Vidovic et. al.,2014	Holstein Friesian	18	Dairy	2014	8649.0	1496.0	6	8615.0	1482.0	6	8425.0	1419.0	6	NS
Zhang et. al.,2007	Holstein	161	Dairy	2007	6668.0	3022.2	21	6825.5	2672.6	45	6829.8	2461.1	95	NS

Protein Content

First Author	Breeds	N	Type	Year	AA	SD1	N1	AB	SD2	N2	BB	SD3	N3	P
Botara et. al.,2008	Holstein	278	Dairy	2009	3.15	0.02	91	3.14	0.02	79	3.13	0.02	108	NS
Botara et. al.,2008	Grilando	156	Dairy	2009	3.15	0.04	33	3.07	0.03	53	3.09	0.03	70	NS
Cardak 2005	Holstein friesian	237	Dairy	2005	3.36	0.12	35	3.31	0.21	112	3.32	0.19	90	NS
Cardak 2005	Simmental	177	Other	2005	3.55	0.14	46	3.52	0.18	82	3.60	0.14	46	*
Czerniawska et. al.,2011	Holstein	102	Dairy	2011	3.57	0.19	8	3.42	0.24	40	3.42	0.23	52	NS
Dokso et. al.,2011	Holstein	113	Dairy	2011	3.29	0.23	15	3.32	0.16	67	3.32	0.22	31	NS
Dyman et. al.,2015	Holstein	200	Dairy	2015	3.14	0.10	86	3.12	0.11	80	3.10	0.07	34	
Eenennaam et. al.,1991	BrownSwiss, Holstein, Jersey, Guernsey, MilkingShorthorn	1165	Other	1990	3.62	0.61	175	3.60	1.10	624	3.60	0.57	366	NS
Felenczak et. al.,2008b	Simmental	367	Other	2008	3.47	0.29	79	3.50	0.27	185	3.56	0.28	103	*
Ikonen et. al.,1999	Ayrshire	18686	Dairy	1998	3.29	0.38	1466	3.29	0.88	7711	3.51	0.02	9509	NS
Juszczak et. al.,2001	Black and White	146	Dairy	2001	3.18	0.16	37	0.21	0.14	68	3.23	0.14	41	NS
Micinski et. al.,2006	Black and White	128	Dairy	2006	3.39	5.43	36	3.32	6.86	65	3.30	5.62	27	NS
Micinski et. al.,2006	Jersey	121	Dairy	2006	3.99	5.74	32	3.98	5.94	65	4.01	7.78	24	NS

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Mohammadi et. al.,2013	Holstein	139	Dairy	2013	3.11	0.38	60	3.16	0.19	39	3.27	0.27	40	*
Molee et. al.,2015	Holstein	231	Dairy	2015	3.01	0.13	40	2.98	0.22	122	3.00	0.16	66	NS
Ojala et. al.,2004	Ayrshire	1548	Dairy	2004	3.31	0.20	1429	3.31	0.21	7482	3.30	0.21	9193	**
Sekerden et. al.,1999	Simmental	96	Other	1999	3.90	0.27	17	3.90	0.30	53	4.10	0.30	26	NS
Vidovic et. al.,2014	Holstein friesland	18	Dairy	2014	2.72	0.42	6	3.07	0.12	6	3.21	0.05	6	NS
Zhang et. al.,2007	Holstein	161	Dairy	2007	3.14	0.32	21	2.99	0.20	45	3.10	0.29	95	*

Protein Yield

First Author	Breeds	N	Type	Year	AA	SD1	N1	AB	SD2	N2	BB	SD3	N3	P
Czerniawska et. al., 2011	Holstein	102	Dairy	2011	236.70	22.15	8	206.80	42.20	40	219.56	29.51	52	
Eenennaam et. al.,1991	BrownSwiss, Holstein, Jersey, Guernsey, MilkingShorthorn	1165	Other	1990	250.00	96.56	175	248.00	172.36	624	245.00	133.91	366	
Felenczak et. al.,2008b	Simmental	367	Other	2008	142.00	43.02	80	160.00	47.88	187	161.00	43.24	104	
Juszczak et. al., 2001	Black and White	146	Dairy	2001	165.10	29.30	37	157.10	30.60	68	154.30	26.30	41	
Micinski et. al.,2006	Black and White	128	Dairy	2006	238.00	12.62	36	212.00	20.36	66	200.00	15.50	27	
Micinski et. al.,2006	Jersey	121	Dairy	2006	164.00	14.17	32	155.00	17.24	66	155.00	11.47	24	
Ojala et. al., 2004	Ayrshire	1548	Dairy	2004	220.00	28.70	1429	218.70	28.40	7482	217.00	28.00	9193	
Sekerden et. al.,1999	Simmental	96	Other	1999	162.30	28.40	17	175.10	34.49	50	175.80	44.05	26	
Vidovic et. al., 2014	Holstein Friesian	18	Dairy	2014	235.30	36.70	172	264.40	35.30	448	270.40	29.80	145	

Fat Content

First Author	Breeds	N	Type	Year	AA	SD1	N1	AB	SD2	N2	BB	SD3	N3	P
Botara et. al.,2008	Holstein	278	Dairy	2009	3.31	0.05	91	3.27	0.05	79	3.36	0.05	108	NS
Botara et. al.,2008	Grilando	156	Dairy	2009	3.14	0.11	33	3.27	0.09	53	3.17	0.06	70	NS
Cardak 2005	Holstein friesland	237	Dairy	2005	4.22	0.24	35	4.21	0.32	112	4.26	0.28	90	NS
Cardak 2005	Simmental	177	Other	2005	4.15	0.34	47	4.07	0.36	82	4.25	0.34	48	**
Celik 2003	BrownSwiss	145	Other	2003	3.24	0.18	25	3.33	0.21	78	3.71	0.36	42	
Czerniawska et. al.,2011	Holstein	102	Dairy	2011	4.01	0.34	8	4.21	0.37	40	4.22	0.34	52	*
Dogru 1994	BrownSwiss	79	Other	1994	4.17	0.40	25	3.99	0.56	124	4.09	0.48	63	**
Dogru 1994	Holstein	39	Dairy	1994	3.90	0.39	6	4.02	0.48	47	4.00	0.41	47	NS
Dogru 2015b	Holstein	64	Dairy	2015	3.91	45.07	13	3.70	16.12	158	3.70	46.57	112	NS
Dogru 2015b	BrownSwiss	129	Other	2015	3.94	49.24	101	3.93	51.50	259	3.88	49.50	255	NS

Supplemental Files

Dokso et. al.,2011	Holstein	113	Dairy	2011	4.25	0.66	15	4.25	0.66	67	4.44	0.61	31	NS
Dyman et. al.,2015	Holstein	200	Dairy	2015	3.83	0.30	86	3.84	0.21	80	3.91	0.19	34	NS
Eenennaam et. al.,1991	BrownSwiss, Holstein, Jersey, Guernsey, MilkingShorthorn	1165	Dairy	1990	4.28	1.07	175	4.28	1.92	624	4.31	1.49	366	NS
Felenczak et. al.,2008b	Simmental	367	Other	2008	4.07	0.30	79	4.07	0.31	185	4.09	0.36	103	NS
Hristov et. al.,2013	Rhodopean	90	Dairy	2013	4.70	0.30	36	4.69	0.07	2	4.79	0.15	58	
Juszczak et. al.,2001	Black and White	146	Dairy	2001	3.96	0.27	37	3.99	0.28	68	4.11	0.32	41	*
Juszczak et. al.,2001	Polish Red	124	Other	2001	4.67	0.29	7	4.22	0.27	27	4.27	0.34	91	
Micinski et. al.,2006	Black and White	128	Dairy	2006	3.90	9.52	36	4.05	8.11	65	4.03	10.20	27	NS
Micinski et. al.,2006	Jersey	121	Dairy	2006	5.96	10.26	32	5.94	10.90	65	5.99	6.16	24	NS
Mohammadi et. al.,2013	Holstein	139	Dairy	2013	3.40	0.59	60	3.39	0.43	39	3.46	0.39	40	NS
Molee et. al.,2015	Holstein	231	Dairy	2015	3.90	0.32	40	3.92	0.44	122	4.03	0.41	66	*
Ojala et. al.,2004	Ayrshire	1548	Dairy	2004	4.42	0.48	1429	4.45	0.48	7482	4.50	0.49	9193	**
Ozdemir et. al.,2007	Holstein	45	Dairy	2007	3.99	0.36	7	3.73	0.42	61	3.65	0.43	22	NS
Ozdemir et. al.,2007	BrownSwiss	80	Other	2007	4.11	0.40	38	4.04	0.36	49	3.93	0.42	90	NS
Sekerden et. al.,1999	Simmental	96	Other	1999	3.90	0.53	17	4.10	0.67	53	3.90	0.68	26	NS
Vidovic et. al.,2014	Holstein friesian	18	Dairy	2014	3.25	0.18	6	3.21	0.16	6	3.26	0.20	6	NS
Zhang et. al.,2007	Holstein	161	Dairy	2007	3.62	0.78	21	3.53	0.80	45	3.66	0.58	95	NS

Fat Yield

First Author	Breeds	N	Type	Year	AA	SD1	N1	AB	SD2	N2	BB	SD3	N3	P
Czerniawska et. al.,2011	Holstein	102	Dairy	2011	266.10	30.70	8	254.90	55.40	40	271.80	41.40	52	NS
Dogru 1994	BrownSwiss	79	Other	1994	115.50	41.00	25	113.70	48.99	124	118.40	45.24	63	NS
Dogru 1994	Holstein	39	Dairy	1994	109.90	37.97	6	144.30	43.19	47	139.60	41.82	47	*
Dogru 2015b	Holstein	64	Dairy	2015	151.40	75.36	13	147.60	79.19	158	133.90	78.31	112	NS
Dogru 2015b	BrownSwiss	129	Other	2015	132.70	52.26	101	131.80	54.72	259	125.70	46.31	255	NS
Eenennaam et. al.,1991	BrownSwiss, Holstein, Jersey, Guernsey, MilkingShorthorn	1165	Other	1990	295.00	121.70	175	293.00	219.82	624	294.00	170.27	366	NS
Felenczak et. al.,2008b	Simmental	367	Other	2008	167.00	51.57	79	186.00	57.76	185	186.00	55.64	103	*
Hristov et. al.,2013	Rhodopean	90	Dairy	2013	168.40	43.56	36	184.30	7.88	2	203.00	7.62	58	
Juszczak et. al.,2001	Black and White	146	Dairy	2001	219.20	39.10	37	211.20	40.90	68	211.20	43.30	41	NS

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Juszczak et. al.,2001	polish Red	124	Other	2001	121.10	23.30	60	112.10	26.50	54	111.30	25.00	10	NS
Lin et. al.,1986	Holstein, Ayrshire, its Crossbreed	920	Dairy	1986	178.00	8.00	27	166.00	4.00	62	171.00	3.00	37	NS
Micinski et. al.,2006	Black and White	128	Dairy	2006	273.00	11.04	36	256.00	17.76	65	244.00	13.23	27	
Micinski et. al.,2006	Jersey	121	Dairy	2006	245.00	15.20	32	230.00	17.38	65	232.00	13.10	24	NS
Ojala et. al.,2004	Ayrshire	1548	Dairy	2004	293.30	42.90	1429	293.50	43.40	7482	295.00	44.00	9193	*
Ozdemir et. al.,2007	Holstein	45	Dairy	2007	162.90	34.13	7	151.90	39.05	61	140.00	40.81	22	NS
Ozdemir et. al.,2007	BrownSwiss	80	Other	2007	139.40	37.60	38	159.50	33.60	49	141.80	38.89	90	NS
Vidovic et. al.,2014	Holstein friesland	18	Dairy	2014	281.10	39.50	6	277.10	43.80	6	274.60	46.30	6	NS

N:Numbers of records, SD: Standard Deviation, P: Significant level, NS: Non-significant, *:p<0.05, **:p<0.01

ALPHA CASEIN GENE GENOTYPIC DATA

Daily Milk Yield

First Author	Breeds	N	Type	Year	BB	SD1	N1	BC	SD2	N2	P
Cardak 2005	Holstein	237	Dairy	2005	28.53	6.34	228	27.69	3.15	9	NS
Cardak 2005	Simmental	177	Other	2005	24.01	2.73	154	22.66	3.19	22	NS
Dogru 1994	BrownSwiss	79	Other	1994	9.90	4.95	46	10.50	4.34	93	NS
Dogru 1994	Holstein	39	Dairy	1994	11.40	4.62	31	10.80	2.50	8	NS
Gurcan 2011	Holstein	90	Dairy	2011	16.74	4.95	200	16.70	3.40	5	NS
Ozdemir 2004	Holstein	48	Dairy	2004	11.60	1.94	38	12.40	1.70	10	NS
Ozdemir 2004	BrownSwiss	80	Other	2004	11.30	1.82	62	11.40	1.59	18	NS
Sekerden et. al.,1999	Simmental	134	Other	1999	13.40	3.61	98	11.70	1.89	5	NS

Lactation Milk Yield

First Author	Breeds	N	Type	Year	BB	SD1	N1	BC	SD2	N2	P
Bovenhuis et. al.,1992	Holstein	6803	Dairy	1992	6138.0	1010.0	6557	6191.0	954.8	245	NS
Dogan and Kaygisiz 1999	BrownSwiss	264	Other	1999	4115.7	3670.8	234	3943.2	1711.0	30	NS
Dogru 1994	BrownSwiss	79	Other	1994	2825.2	1326.6	121	3046.3	1154.3	93	NS
Dogru 1994	Holstein	39	Dairy	1994	3509.6	1221.1	101	3394.8	719.2	6	NS
Eenennaam et. al.,1991	BrownSwiss, Holstein, Jersey, Guernsey, MilkingShorthorn	1454	Dairy	1990	6855.0	6033.9	1056	6945.0	2033.4	92	NS
Gurcan 2011	Holstein	90	Dairy	2011	4590.0	5014.6	200	4119.0	428.7	5	NS
Hristov et. al.,2013	Rhodopean	90	Dairy	2013	3601.8	753.4	24	3877.3	917.4	64	NS
Kaygisiz et. al.,1999	Holstein	96	Dairy	1999	4361.3	2114.3	189	4617.1	1115.1	17	NS
Kaygisiz 2000	Simmental	129	Other	2000	5799.0	9344.2	670	5001.0	5065.6	88	NS
Lin et. al.,1986	Holstein, Ayrshire, its Crossbreed	920	Dairy	1986	4433.0	2434.5	840	4226.0	1104.0	78	NS
Micinski et. al.,2006	Black and White	128	Dairy	2006	6595.0	16.3	127	5301.0	0.0	1	NS
Micinski et. al.,2006	Jersey	121	Dairy	2006	4353.0	24.1	88	4261.0	16.7	33	NS
Ozdemir et. al.,2004	Holstein	48	Dairy	2004	3965.0	974.9	71	4461.8	853.0	19	NS

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Ozdemir et. al.,2004	BrownSwiss	80	Other	2004	3684.0	933.8	130	3824.3	800.9	48	NS
Sekerden et. al.,1999	Simmental	134	Other	1999	4388.8	766.6	98	3784.5	894.5	5	NS
Protein Content											
First Author	Breeds	N	Type	Year	BB	SD1	N1	BC	SD2	N2	P
Bovenhuis et. al.,1992	Holstein	6803	Dairy	1992	3.46	0.19	6557	3.50	0.16	245	**
Cardak 2005	Holstein	237	Dairy	2005	3.31	0.30	228	3.43	0.15	9	**
Cardak 2005	Simmental	177	Other	2005	3.54	0.12	154	3.67	0.19	22	**
Eenennaam et. al.,1991	BrownSwiss, Holstein, Jersey, Guernsey, MilkingShorthorn	1454	Dairy	1990	3.57	0.37	1056	3.62	0.39	92	NS
Micinski et. al.,2006	Black and White	128	Dairy	2006	3.34	6.25	127	3.29	0.00	1	NS
Micinski et. al.,2006	Jersey	121	Dairy	2006	4.04	9.67	88	4.02	4.92	33	NS
Sekerden et. al.,1999	Simmental	134	Other	1999	4.00	0.30	98	3.90	0.31	5	NS
Hristov et. al.,2013	Rhodopean	90	Dairy	2013	3.68	0.29	24	3.63	0.24	64	NS
Protein Yield											
First Author	Breeds	N	Type	Year	BB	SD1	N1	BC	SD2	N2	P
Bovenhuis et. al.,1992	Holstein	6803	Dairy	1992	211.90	32.80	6557	216.80	28.80	245	*
Eenennaam et. al.,1991	BrownSwiss, Holstein, Jersey, Guernsey, MilkingShorthorn	1454	Dairy	1991	240.00	184.70	1050	247.00	62.35	92	
Micinski et. al.,2006	Black and White	128	Dairy	2006	220.00	17.32	127	175.00	0.00	1	
Micinski et. al.,2006	Jersey	121	Dairy	2006	160.00	11.41	88	156.00	16.83	33	
Sekerden et. al.,1999	Simmental	134	Beef	1999	175.00	0.35	98	138.40	28.63	5	
Fat Content											
First Author	Breeds	N	Type	Year	BB	SD1	N1	BC	SD2	N2	P
Bovenhuis et. al.,1992	Holstein	6803	Dairy	1992	4.56	0.44	6557	4.52	0.47	245	
Cardak 2005	Holstein	237	Dairy	2005	4.22	0.30	228	4.31	0.21	9	NS
Cardak 2005	Simmental	177	Other	2005	4.12	0.37	154	4.15	0.42	22	*
Dogru 1994	BrownSwiss	79	Other	1994	4.00	0.55	121	4.07	0.48	91	NS
Dogru 1994	Holstein	39	Dairy	1994	3.99	0.49	94	4.19	0.39	6	NS

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Eenennaam et. al.,1991	BrownSwiss, Holstein, Jersey, Guernsey, MilkingShorthorn	1454	Dairy	1990	4.29	2.08	1056	4.26	0.70	92	NS
Hristov et. al.,2013	Rhodopean	90	Dairy	2013	4.72	0.39	24	4.66	0.32	64	NS
Micinski et. al.,2006	Black and White	128	Dairy	2006	3.99	9.05	127	4.06	0.00	1	NS
Micinski et. al.,2006	Jersey	121	Dairy	2006	5.98	11.39	88	5.96	11.60	33	NS
Ozdemir et. al.,2004	Holstein	48	Dairy	2004	3.74	0.46	71	3.73	0.40	19	NS
Ozdemir et. al.,2004	BrownSwiss	80	Other	2004	4.00	0.44	129	4.01	0.37	48	NS
Sekerden et. al.,1999	Simmental	134	Other	1999	4.00	0.66	98	4.10	0.32	5	NS
Fat Yield											
First Author	Breeds	N	Type	Year	BB	SD1	N1	BC	SD2	N2	P
Bovenhuis et. al.,1992	Holstein	6803	Dairy	1992	278.50	43.20	6557	278.81	40.22	245	
Dogru 1994	BrownSwiss	79	Other	1994	110.90	51.70	121	120.70	44.84	91	NS
Dogru 1994	Holstein	39	Dairy	1994	140.70	47.51	94	134.20	37.48	6	NS
Eenennaam et. al.,1991	BrownSwiss, Holstein, Jersey, Guernsey, MilkingShorthorn	1454	Dairy	1990	287.11	237.20	1056	290.00	79.61	92	NS
Hristov et. al.,2013	Rhodopean	90	Dairy	2013	170.06	39.19	24	179.93	40.96	64	NS
Lin et. al.,1986	Holstein, Ayrshire, its Crossbreed	920	Dairy	1986	174.00	86.95	840	169.00	44.16	78	NS
Micinski et. al.,2006	Black and White	128	Dairy	2006	261.00	14.56	127	212.00	0.00	1	NS
Micinski et. al.,2006	Jersey	121	Dairy	2006	261.00	25.99	88	254.00	20.95	33	NS
Ozdemir et. al.,2004	Holstein	48	Dairy	2004	150.10	42.13	71	171.00	37.05	19	NS
Ozdemir et. al.,2004	BrownSwiss	80	Other	2004	147.00	40.89	129	153.80	34.64	48	NS

N:Numbers of records, SD: Standard Deviation, P: Significant level, NS: Non-significant, *:p<0.05, **:p<0.01